EXHIBIT 19

SECOND EDITION

COMPREHENSIVE DICTIONARY OF ELECTRICAL ENGINEERING

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(2) the component of color which is independent of, and complementary to luminance; chrominance is 2-D: for example, it can be decomposed into hue and saturation. *See* hue, Intensity, luminance, saturation.

chronaxie the minimum duration of a unidirectional square-wave current needed to excite a nerve when the current magnitude is twice rheobase.

CIE *See* Commision International d'Eclairage.

CIE diagram the projection of the plane $(X + Y + Z) = 1$ onto the XY plane, where X, Y, Z are the respective tristimulus values as defined by the CIE (tristimulus values and Commision Internationale de l'Eclairage). The CIE diagram shows all of the visible chromaticity values and maps all colors with the same chromaticity but different value (luminances) onto the same points.

CIM *See* computer-integrated manufacturing.

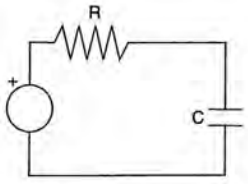
CIR *See* carrier-to-interference ratio.

circle detection the location of circles in an image by a computer. Often accomplished with the Hough transform.

circle diagram (1) graphical representation of the operation of an induction machine. It is based on the approximate equivalent circuit and expresses stator and rotor current relations for all operating modes (motor, braking, generator) and all values of slip. Several variations of the diagram exist.

(2) graphical representation of the power flow through a transmission line. The maximum power flow through the line can be determined by the impedance of the line.

circuit a physical device consisting of an interconnection of elements, or a topological model of such a device. For example, an electric circuit may be constructed by interconnecting a resistor and a capacitor to a voltage source. A representation of this circuit is shown by the diagram in the figure.



Circuit example.

circuit (STM) switching technology that provides a direct connection between two endpoints; data is transferred directly between the endpoints of a circuit without being stored in any intermediate nodes.

circuit breaker a device that makes and breaks the electrical contact between its input and output terminals. The circuit breaker is capable of clearing fault currents (tripping) as well as load currents. The circuit breaker consists of power contacts with arc clearing capability and associated control and auxiliary circuits for closing and tripping the breaker under the required conditions.

circuit protection devices or control measures used to safeguard electrical circuits from unsafe operating regions, such as overcurrents and overvoltages.

circuit switching a method of communication in which a physical circuit is established between two terminating equipments before communication begins to take place. This is analogous to an ordinary phone call.

circuit-set a closed path where all vertices are of degree 2, thus having no endpoints in the path.

controlled rectifier a rectifier that uses switching elements that have forward voltage blocking capability to allow a variable voltage DC output. *See also* thyristor.

controlled source a voltage or current source whose intensity is controlled by a circuit voltage or current elsewhere in the circuit. Also called dependent source.

controlled variable (1) the quantity, usually the output of a plant or process, that is being controlled for the purpose of the desired behavior, for example, transient response or steady-state response.

(2) variable associated with the behavior of the controlled process and such that one wants this variable either to follow a desired trajectory over a given time interval or to be kept at a prescribed constant value, i.e., at a specified set-point; introduction of a set of controlled variables is necessary to define a two-layer industrial controller with the regulation direct control layer and the set point optimizing control layer.

See also controller.

controller (1) the entity that enforces the desired behavior — as specified by the control objectives — of the controlled process by adjusting the manipulated inputs. The values of these inputs are either predetermined or decided upon (computed) using on-line, i.e., real time, decision mechanism of the controller — based on the currently available information. *See also* controlled variable.

(2) a device that generates the input to the plant or process. The role of the controller is to force the controlled variable of the plant or process to behave in a desired manner.

(3) a unit that directs the operation of a subsystem within a computer. For instance, a disk controller interprets data access commands from host computer (via a bus), and sends read/write, track seeking, and other control signals to the drive. During this time, the computer can perform other tasks, until the controller signals DATA READY for transfer via the CPU bus.

convection current a current in which electrons are released for movement outside of a material.

convective heat transfer the process by which a moving fluid transfers heat to or from a wetted surface.

convergence the condition when the electron beams from a multi-beam CRT meet at a single point. For example, the correct registration of the three beams in the color picture tube.

convergence in probability for some sequences of random numbers, the tendency to a single number.

To wit, for a sequence of numbers x_n, and a random variable x, if for all $\epsilon > 0$,

$$P\{|x_n - x| > \epsilon\} \to 0$$

for $n \to \infty$, then the sequence x_n tends to x in probability.

convergent state the equilibrium state of a dynamic system described by a first order vector differential equation is said to be convergent if there exists a $\delta = \delta(t_0)$, such that,

$$\| x(t_0) - x_e \| < \delta \Rightarrow \lim_{t \to \infty} x(t) = x_e$$

See also stable state.

converter a generic term used in the area of power electronics to describe a rectifier, inverter, or other power electronic device that transforms electrical power from one frequency and voltage to another.

convex fuzzy set (1) a fuzzy set that has a convex type of membership function.

(2) a fuzzy set in which all α-level sets are convex. *See also* α-level set.

convolution the mathematical operation needed to determine the response of a system from its

$R_- < |z| < R_+$, where R_- and R_+ denote real parameters that are related to the causal and anticausal components, respectively, for the signal whose z-transform is being sought.

(3) an area on a display device where the image displayed meets an accepted criteria for raster coordinate deviation. *See* region of absolute convergence.

region of interest (ROI) a restricted set of image pixels upon which image processing operations are performed. Such a set of pixels might be those representing an object that is to be analyzed or inspected.

region of support the region of variable or variables where the function has non-zero value.

register a circuit formed from identical flip-flops or latches and capable of storing several bits of data.

register alias table *See* virtual register.

register direct addressing an instruction addressing method in which the memory address of the data to be accessed or stored is found in a general purpose register.

register file a collection of CPU registers addressable by number.

register indirect addressing an instruction addressing method in which the register field contains a pointer to a memory location that contains the memory address of the data to be accessed or stored.

register renaming dynamically allocating a location in a special register file for an instance of a destination register appearing in an instruction prior to its execution. Used to remove antidependencies and output dependencies. *See also* reorder buffer.

register transfer notation a mathematical notation to show the movement of data from one register to another register by using a backward arrow. Notation used to describe elementary operations that take place during the execution of a machine instruction.

register window in the SPARC architecture, a set or window of registers selected out of a larger group.

registration (1) *See* overlay.

(2) the process of aligning multiple images obtained from different modalities, at different timepoints, or with different image acquisition parameters. *See* fusion.

regression the methods which use backward prediction error as input to produce an estimation of a desired signal. Quantitatively, the regression of y on X, denoted by $r(y)$, is defined as the first conditional moment, i.e.,

$$r(y) = E(X|y)$$

regular controllability a dynamical system is said to be regularly controllable in time interval $[t_0, t_1]$ if every dynamical system of the form

$$x'(t) = Ax(t)x(t) + b_j u_j(t)$$
$$j = 1, 2, \ldots, m$$

is controllable where b_j is the jth column of the matrix B and $u_j(t)$ is the jth scalar admissible control.

regular cue any regular recurring point/element of a signal that can be used to signal the start of a new signal sequence; e.g., the leading edge of a 60-Hz square wave is a regular cue.

regular form a particular form of the state space description of a dynamical system. This form is obtained by a suitable transformation of